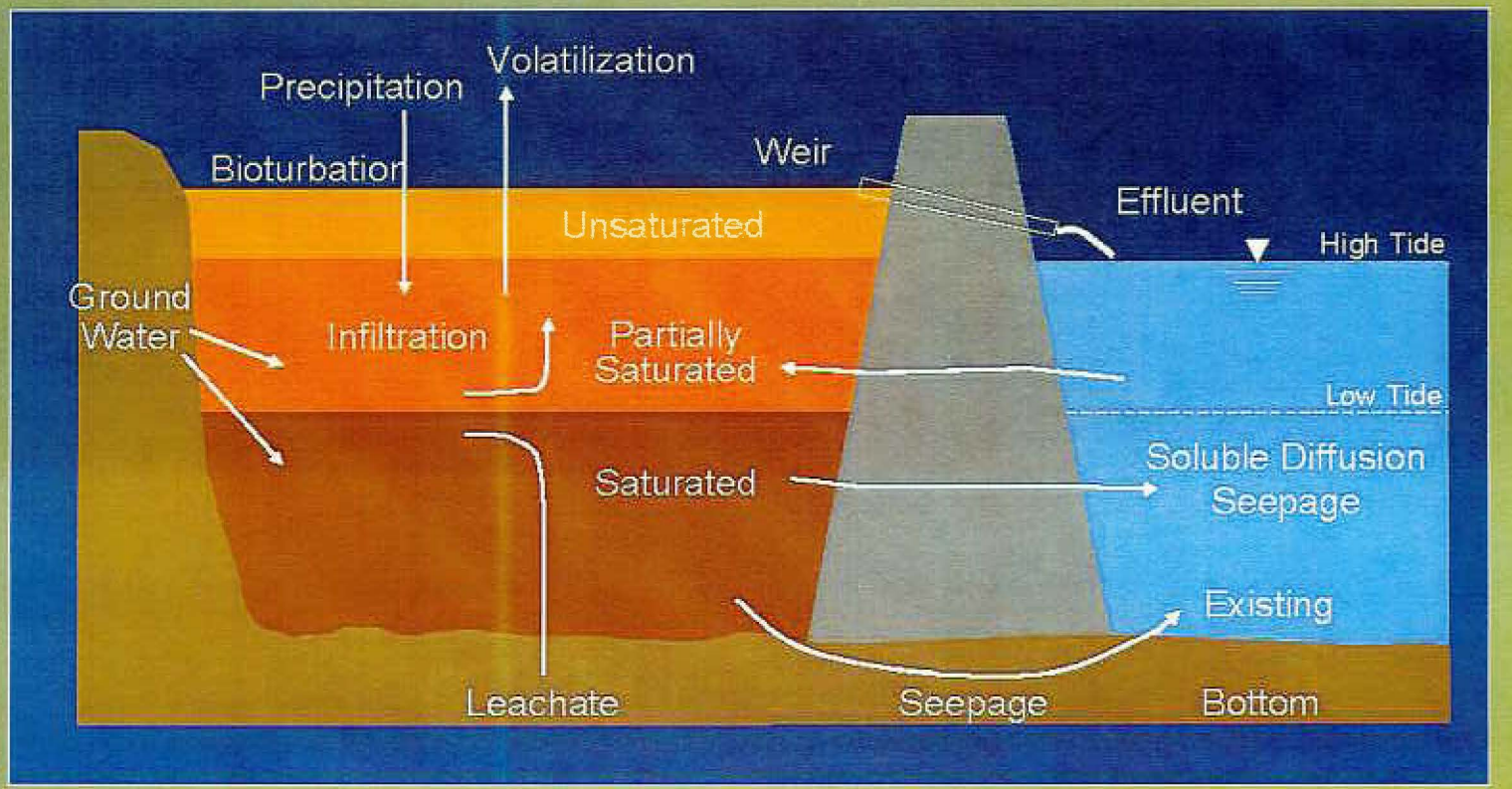
Alternative Means of Confining Contaminated Dredged Material



PNWA Summer Conference 2012

Presented by: Carl McNabb, P.E., PND Engineers, Inc.

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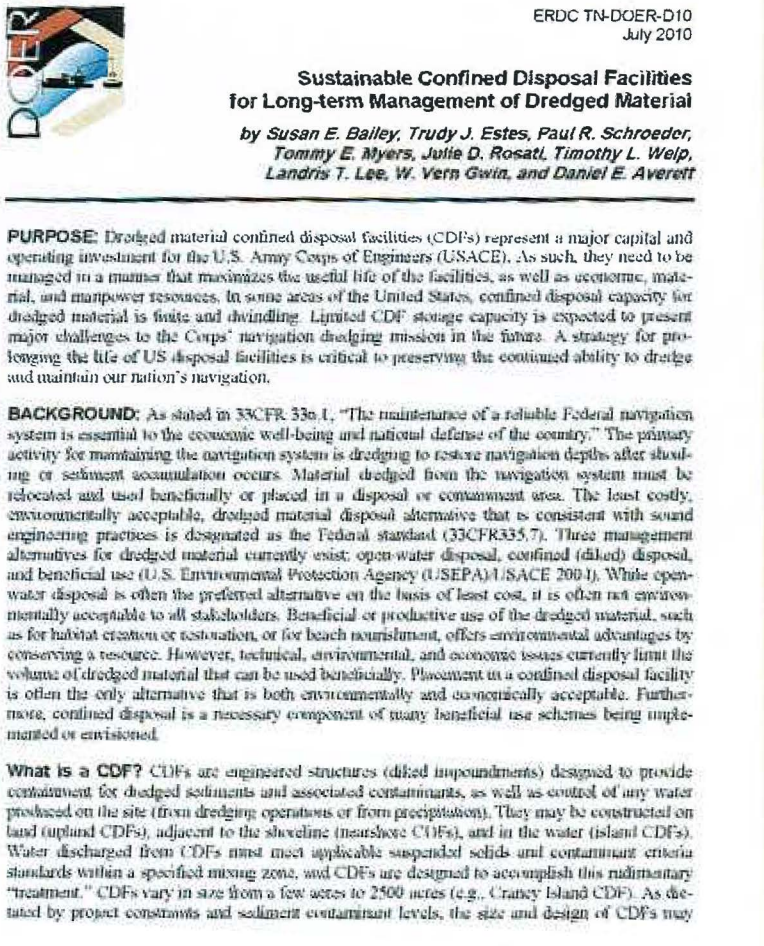
Report on Status of Nation's Confined Disposal Facilities



ERDC TN-DOER-D10
July 2010

Sustainable Confined Disposal Facilities for Long-term Management of Dredged Material

by Susan E. Bailey, Trudy J. Estes, Paul R. Schroeder, Tommy E. Myers, Julie D. Rosati, Timothy L. Welp, Landris T. Lee, W. Vern Gwin, and Daniel E. Averett

PURPOSE: Dredged material confined disposal facilities (CDFs) represent a major capital and operating investment for the U.S. Army Corps of Engineers (USACE). As such, they need to be managed in a manner that maximizes the useful life of the facilities, as well as economic, material, and manpower resources. In some areas of the United States, confined disposal capacity for dredged material is finite and dwindling. Limited CDF storage capacity is expected to present major challenges to the Corps' navigation dredging mission in the future. A strategy for prolonging the life of US disposal facilities is critical to preserving the continued ability to dredge and maintain our nation's navigation.

BACKGROUND: As stated in 33CFR 33o.1, "The maintenance of a reliable Federal navigation system is essential to the economic well-being and national defense of the country." The primary activity for maintaining the navigation system is dredging to restore navigation depths after shoaling or sediment accumulation occurs. Material dredged from the navigation system must be relocated and used beneficially or placed in a disposal or containment area. The least costly, environmentally acceptable, dredged material disposal alternative that is consistent with sound engineering practices is designated as the Federal standard (33CFR335.7). Three management alternatives for dredged material currently exist: open-water disposal, confined (diked) disposal, and beneficial use (U.S. Environmental Protection Agency (USEPA)/USACE 2004). While open-water disposal is often the preferred alternative on the basis of least cost, it is often not environmentally acceptable to all stakeholders. Beneficial or productive use of the dredged material, such as for habitat creation or restoration, or for beach nourishment, offers environmental advantages by conserving a resource. However, technical, environmental, and economic issues currently limit the volume of dredged material that can be used beneficially. Placement in a confined disposal facility is often the only alternative that is both environmentally and economically acceptable. Furthermore, confined disposal is a necessary component of many beneficial use schemes being implemented or envisioned.

What is a CDF? CDFs are engineered structures (diked impoundments) designed to provide containment for dredged sediments and associated contaminants, as well as control of any water produced on the site (from dredging operations or from precipitation). They may be constructed on land (upland CDFs), adjacent to the shoreline (nearshore CDFs), and in the water (island CDFs). Water discharged from CDFs must meet applicable suspended solids and contaminant criteria standards within a specified mixing zone, and CDFs are designed to accomplish this rudimentary "treatment." CDFs vary in size from a few acres to 2500 acres (e.g., Craney Island CDF). As dictated by project constraints and sediment contaminant levels, the size and design of CDFs may

Report by USACE describes:

- Surveyed COE Districts across US
- Describes dwindling capacity
- Offers methods to lengthen life of CDFs

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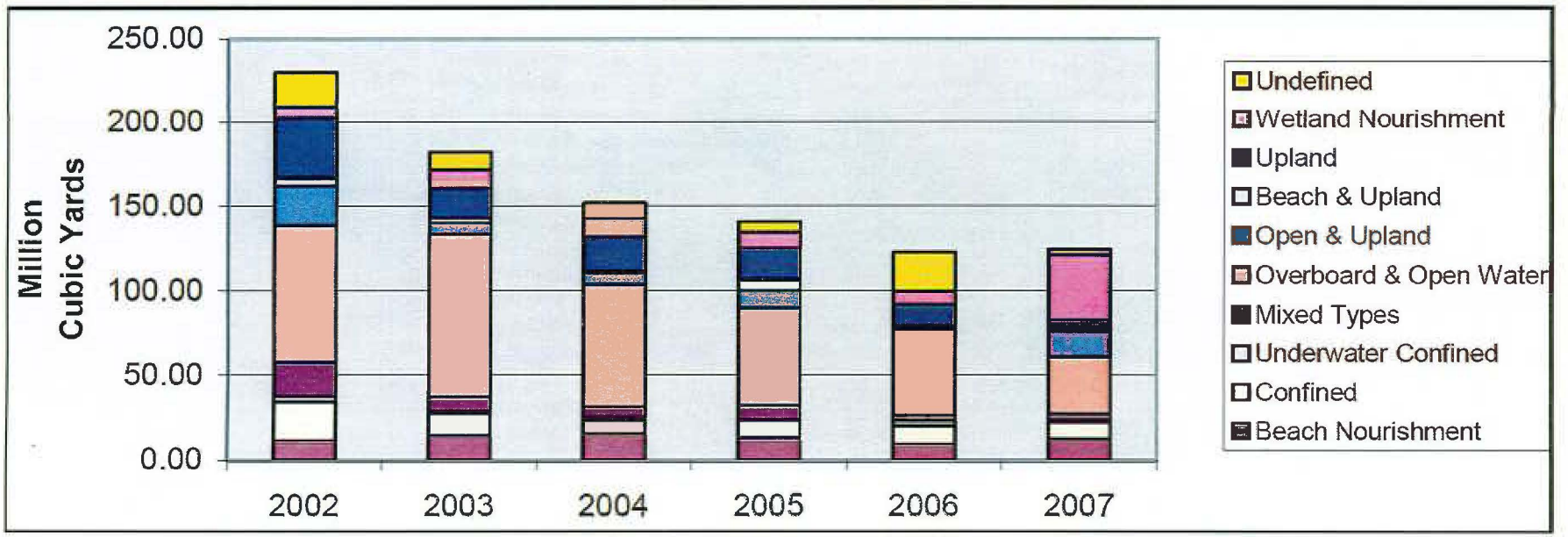
Vertical Confined Disposal Facilities



Corps of Engineers annual dredged material placement (IWR 2008)

Alternative Containment Method Review

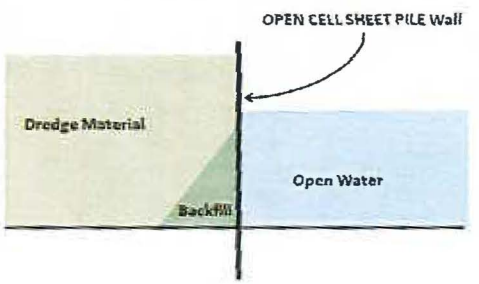
ERDC/EL LR

Environmental Laboratory

US Army Corps of Engineers®
Engineer Research and Development Center

Confinement of Contaminated Dredged Material Utilizing the OPEN CELL SHEET PILE SYSTEM®

Barry W. Bunch, John Childs, Paul Schroeder — Oct 2011



USACE concluded in its final report that the OPEN CELL® system, "...can be effective for controlling environmental risk for containment of dredge material."

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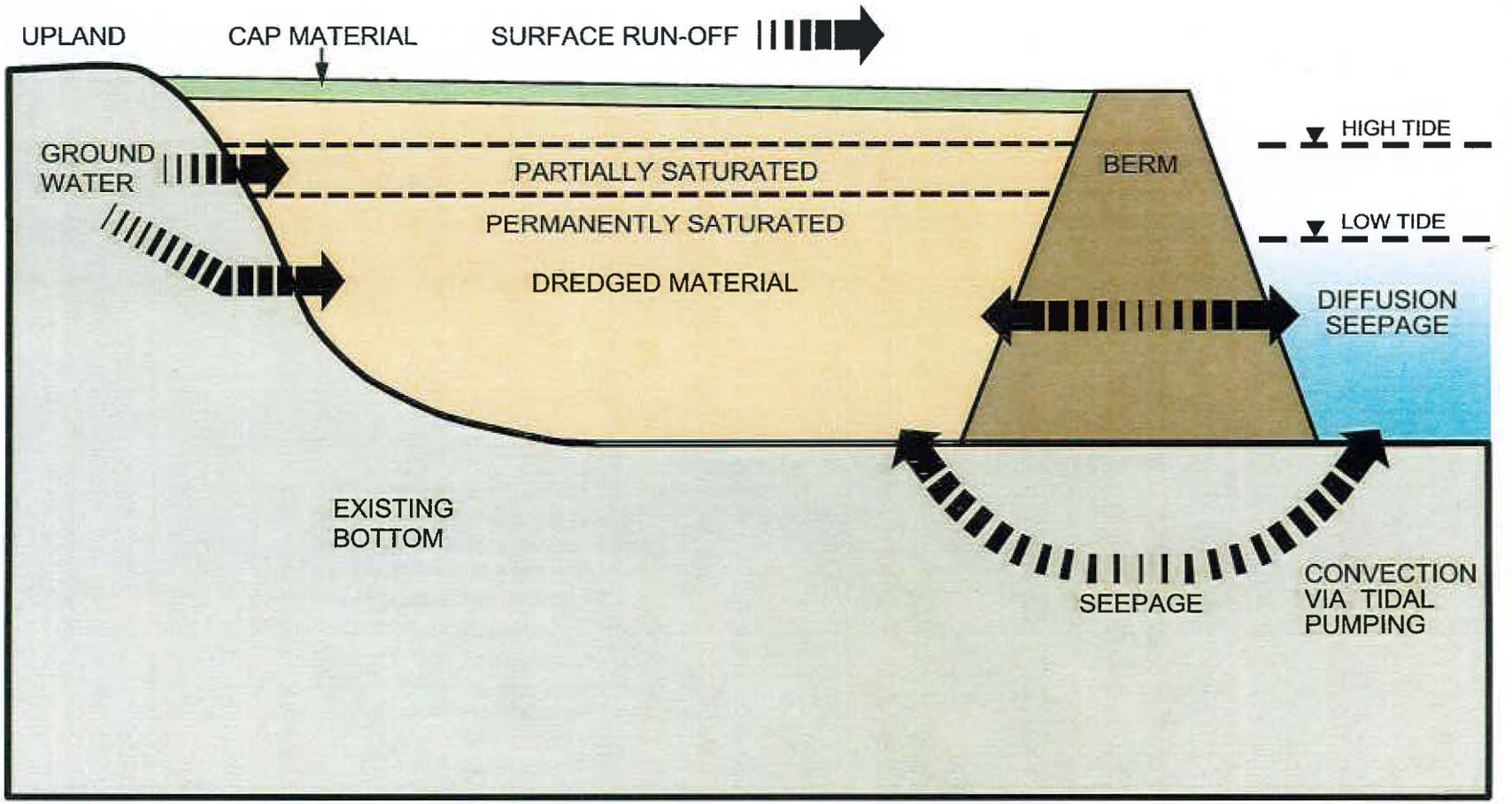
CDF Dike Cross Section



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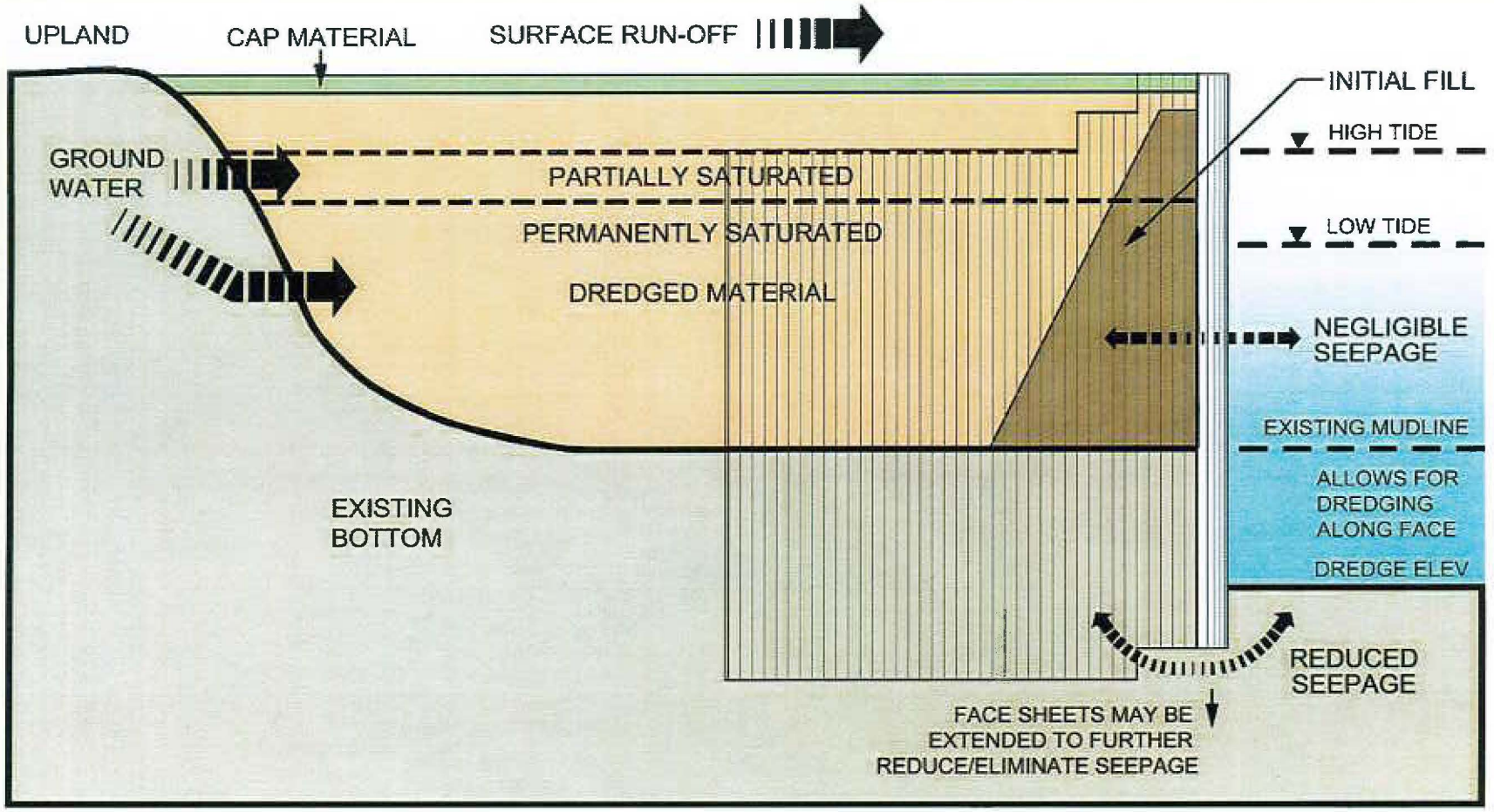
OPEN CELL® CDF Cross Section



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Advantages:

- Capacity - Increased storage of dredged material
- Constructability - In soft soil conditions and deeper water
- Stability - In high seismic areas
- Impermeability – Virtually watertight, eliminates leakage
- Functionality - Beneficial use of frontage after filling

Construction of an OPEN CELL Structure

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Similar Project:

American Construction Bulkhead | Hylebos Waterway, WA | 2005

Encapsulated creosote-treated timber piles and existing, depilated bulkhead

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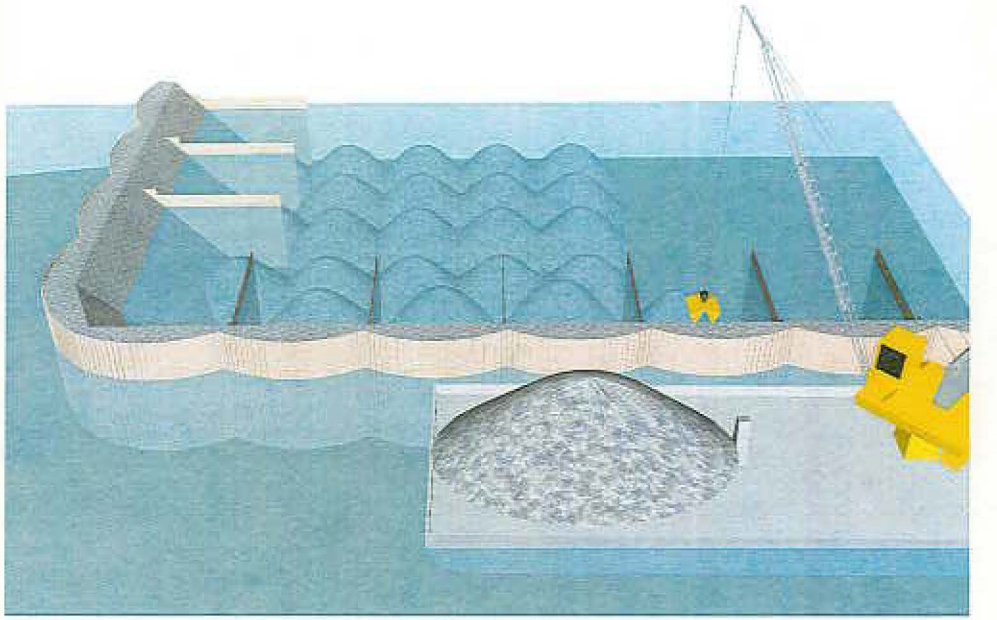

To see the full version of the USACE's report, visit us online: www.pndengineers.com
Follow the "OPEN CELL® Structures" link on the homepage, and navigate to 'Applications for Contaminated Soils'

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